AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 7. (Canceled)

8. (Previously Presented) A plasma processing apparatus comprising:

a vacuum processing chamber for processing a sample, including an insulator film, by using plasma;

an outer chamber connected with an evacuation means;

a gas supplying unit for introducing into the vacuum processing chamber a fluorine-containing processing gas;

an upper electrode and a lower electrode for generating plasma therebetween and providing the vacuum processing chamber;

an electrode cover comprised of silicon being provided at the outer surface of the upper electrode; and

a discharge confining means comprised of silicon for surrounding the vacuum processing chamber.

9. (Previously Presented) The plasma processing apparatus according to claim 8; the lower electrode having a sample mounting surface; said apparatus further comprising a susceptive cover comprised of silicon near the sample mounting surface.

10. (Previously Presented) A plasma processing apparatus comprising:

a vacuum processing chamber for processing a sample, including an insulator film, by using plasma;

a gas supplying unit for introducing into the vacuum processing chamber a fluorine-containing processing gas;

an upper electrode and a lower electrode for providing the vacuum processing chamber therebetween;

a high frequency electric power source for supplying a high frequency energy for generating plasma between the upper electrode and the lower electrode;

a bias electric power source connected to the lower electrode to control energy of ions in the plasma;

an electrode cover comprised of silicon being provided at the outer surface of the upper electrode;

a susceptive cover comprised of silicon being provided near a sample mounting surface of the lower electrode; and

a discharge confining means comprised of silicon for surrounding the vacuum processing chamber;

wherein an inner surface of the vacuum processing chamber is substantially constituted by surfaces of silicon except for the sample mounting surface.

11. (Previously Presented) The plasma processing apparatus according to claim 10, further comprising an outer chamber located outside of the vacuum processing chamber and connected with an evacuation means.

12. (Currently Amended) The plasma processing apparatus according to claim 10, wherein the discharge confining means includes at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

13. (Previously Presented) The plasma processing apparatus according to claim 8, wherein the discharge confining means is ring-shaped.

14. (Previously Presented) The plasma processing apparatus according to claim 9, wherein the discharge confining means is ring-shaped.

15. (Previously Presented) The plasma processing apparatus according to claim 10, wherein the discharge confining means is ring-shaped.

16. (Previously Presented) The plasma processing apparatus according to claim 8, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

17. (Previously Presented) The plasma processing apparatus according to claim 9, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

18. (Previously Presented) The plasma processing apparatus according to claim 13, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

19. (Previously Presented) A plasma processing apparatus comprising:

a vacuum container for processing a sample including an insulator film by use of plasma;

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

an upper electrode and lower electrode having plasma generated therebetween;

an electrode cover provided at the bottom surface of the upper electrode;

a discharge confining means defining a vacuum processing chamber in the space between said upper and lower electrodes; and

wherein both said electrode cover and said discharging confining means are comprised of silicon.

20. (Previously Presented) The plasma processing apparatus according to claim 19:

wherein said lower electrode includes a sample mounting surface, and further comprising a susceptive cover around the sample mounting surface, and wherein said susceptive cover is also comprised of silicon.

21. (Previously Presented) A plasma processing apparatus comprising:

a vacuum container for processing of a sample including an insulator film through the use of plasma;

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

an upper electrode and lower electrode for defining a vacuum processing chamber therebetween;

a high frequency electric power source for supplying a high frequency energy for generating plasma in the vacuum processing chamber;

a bias electric power source connected to the lower electrode to control the energy of ions in the plasma;

an electrode cover being provided at the bottom surface of the upper electrode;

a susceptive cover provided around a sample mounting surface of the lower electrode;

a discharge confining means for surrounding the vacuum processing chamber; and

wherein the electrode cover, susceptive cover, and discharge confining means are all comprised of silicon.

22. (Previously Presented) The plasma processing apparatus according to claim 21 further comprising an outer chamber defined within the vacuum container outside of the vacuum processing chamber, said outer chamber being connected with an evacuation means.

23. (Previously Presented) The plasma processing apparatus according to claim 21 wherein the discharge confining means includes at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

24. (Previously Presented) The plasma processing apparatus as in claim 19 wherein the discharge confining means is ring shaped.

25. (Previously Presented) The plasma processing apparatus according to claim 19 and further comprising an outer chamber defined in said vacuum container outside of said vacuum processing chamber and wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outside chamber.

26. (Previously Presented) A method for improving the selectivity in the etching of a sample including an insulator film by using a plasma processing apparatus, the apparatus including a vacuum container, an upper electrode and a lower electrode providing a vacuum processing chamber therebetween, a high frequency electric source for supplying a high frequency energy for generating plasma in the vacuum processing chamber, a bias electric power source connected to the lower electrode to control th ions energy of the ions in the plasma, said method comprising:

providing an electrode cover comprised of silicon on the bottom surface of the upper electrode;

providing a susceptive cover comprised of silicon around a sample mounting surface of the lower electrode; and

providing a discharge confining means comprised of silicon surrounding the vacuum processing chamber.

27. (New) A plasma etching apparatus comprising:

a vacuum container for processing a sample including an insulator film by use of plasma;

an upper electrode and lower electrode having plasma generated therebetween;

wherein said plasma etching apparatus further comprises:

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

means for generating a plasma between said upper electrode and lower electrode to etch a fine pattern of 0.2 μm or smaller on the sample having a diameter of 300 mm or more;

a bias electric power source connected to the lower electrode to control energy of ions in said plasma;

a discharge confining means defining a vacuum processing chamber in the space between said upper and lower electrodes;

an electrode cover provided at the bottom surface of the upper electrode, wherein the electrode cover is comprised of silicon and includes holes to pass the processing gas;

a susceptive cover, comprised of silicon, provided around a sample mounting surface of the lower electrode.

28. (New) A plasma etching apparatus comprising:

a vacuum container for processing a sample including an insulator film by use of plasma;

an upper electrode and lower electrode having plasma generated therebetween;

wherein said plasma etching apparatus further comprises:

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

means for generating a plasma with a density of 5×10^{10} cm^{-3} to 5×10^{11} cm^{-3} between said upper electrode and lower electrode to etch a fine pattern of 0.2 μm or smaller on the sample having a diameter of 300 mm or more;

a bias electric power source connected to the lower electrode to control energy of ions in said plasma;

a discharge confining means defining a vacuum processing chamber in the space between said upper and lower electrodes;

an electrode cover provided at the bottom surface of the upper electrode, wherein the electrode cover is comprised of silicon and includes hole to pass the processing gas; and

a susceptive cover comprised of silicon provided around the sample mounting surface of the lower electrode.

29. (New) A plasma etching apparatus according to claim 26, wherein said discharge confining means is comprised of silicon.

30. (New) A plasma etching apparatus according to claim 28, wherein said discharge confining means is comprised of silicon.